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# Productivity Dispersion and Input Prices: The Case of Electricity

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## Abstract

Measured productivity differences among firms and establishments in the same narrowly defined industry are "extremely large" (Bartelsman and Doms, 2000). Empirical studies also find that more productive businesses tend to have higher market shares, and that market shares tend to rise over time for businesses with higher productivity levels and growth rates. These facts are intriguing, but their interpretation and analysis have been hampered by a dearth of data on output and input prices at the level of firms and establishments. As a result, most micro-level productivity measures are confounded by unmeasured demand variation and unmeasured input price differences.

In this study, we exploit a rich new database on Prices and Quantities of Electricity in Manufacturing (PQEM) to distinguish between physical efficiency in the use of electricity (output per kWh) and price paid per kWh, or "price efficiency". We quantify physical efficiency and price efficiency differences among producers and their contributions to overall productivity dispersion. We identify plant-level characteristics associated with relatively high or low values of physical efficiency and price efficiency. We also investigate how dispersion in these efficiency measures varies with electricity cost shares across industries and over time in the previous four decades.

Our results reveal large differences in electricity prices within narrowly defined manufacturing industries. The within-industry standard deviation of log electricity prices (weighted by electricity purchases) ranges from 23% to 44% in the previous four decades. Much of this price variation reflects quantity discounts that are explained by differences in electricity supply costs between bigger and smaller industrial customers. We also find higher market shares within industries for producers with greater physical efficiency and greater price efficiency (i.e., lower price per kWh).

Reference

Bartelsman, Eric J. and Mark Doms (2000) "Understanding Productivity: Lessons from Longitudinal Micro Data," *Journal of Economic Literature,* 38:3, 569-594.

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